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Genera of the Trichogrammatidae (Hymenoptera : Chalcidoidea) of Taiwan with descriptions of new taxa

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Abstract : This paper is based upon the examination of about 7,000 slide specimens of trichogrammatids which were mostly collected by sweep net in Taiwan. It consist of 22 genera. Of these, only *Paracentrobia* Hwd., *Trichogrammatoidea* Grlt., *Trichogramma* West. and *Oligosita* Wlk. have been previously known to this island, whereas *Ufens* Grlt., *Poropoea* Frst., *Ophioneurus* Rtbg., *Lathromeroidea* Grlt., *Lathromeris* Frst., *Hispidophila* Vigg., *Haeckeliania* Grlt., *Chaetostricha* Wlk., *Uscana* Grlt., *Latheromeromyia* Grlt., *Giraultiola* Nwk., *Probrachista* Vigg., *Aphelinoidea* Grlt., *Epoligosita* Grlt. and *Megaphragma* Tblk. are hereby recorded for the first time, and *Prochaetostricha monticola* and *Eutrichogramma elongatum*, genn. et spp. nov. are described and illustrated. A key is given for the separation of the genera of Taiwan.

The small to minute members of the family Trichogrammatidae, Hymenoptera, are widespread, abundant, and reflects their mode of development as internal parasites of various insect eggs, mostly of Lepidoptera or Homoptera, and to a less extent of some other orders. The minuter adults of *Megaphragma* may measure no more than 0.18 mm. in total length these are probably the smallest of all insects for they develop within the eggs of thrips. Some of trichogrammatids are interesting in habit which has adopted an aquatic habitat. Of these, parasitizes the eggs of aquatic insects mainly those of water beetles, water bugs or dragonflies. They can swim in and on the surface of water with their legs, which are long and slender fringed with long hairs.

The trichogrammatid wasps, especially the genus *Trichogramma* has been used for biological control of various farm, vegetable and forest pests, mostly of the Lepidoptera, in different countries of the World.

The Trichogrammatidae of Taiwan have hitherto been little studied, the previous authors as Ishii (1941), Sonan (1944), Lin (1974) and Nagaraja (1978) recorded *Trichogramma australicum*, *T. chilonis*, *T. dendrolimi*, *T. japonicum*, *Trichogrammatoidea bactrae*,

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T. nana, *Paracentrobia andoi* and *Oligosita* spp. from this island.

The specimens of Trichogrammatidae in this study are more than 7,000 slides which were mostly collected by the author use of sweeping net on the weeds or secondary forest. Twenty-two genera are discorvered as 4 of the known genera and 16 the first records. Two new genera and species are described. All specimens are deposited in the Insect Collection of the Taiwan Agricultural Research Institute, Taichung.

List of genera

(Those marked with an asterisk are new records for Taiwan)

1. **Ufens* Girault
2. **Mirufens* Girault
3. **Poropoea* Förster
4. **Ophioneurus* Ratzeburg
5. **Lathromeroidea* Girault
6. **Lathromeris* Förster
7. **Hispidophila* Viggiani
8. **Haeckeliania* Girault
9. **Prochaetostricha* gen. nov.
10. **Chaetostricha* Walker
11. *Paracentrobia* Howard
12. **Uscana* Girault
13. **Lathromeromyia* Girault
14. **Giraultiola* Nowicki
15. *Trichogramatoidea* Girault
16. *Trichogramma* Westwood
17. **Probrachista* Viggiani
18. **Eutrichogramma* gen. nov.
19. **Aphelinoidea* Girault
20. *Oligosita* Walker
21. **Epoligosita* Girault
22. **Megaphragma* Timberlake

Tentative key to genera of Trichogrammatidae in Taiwan

1. Body dorso-ventrally flattened, abdomen very broad; forewing narrow, peculiarly shaped as a flattened sigmoid, marginal fringe very long; body size unusually small, ranging in length of 0.15-0.25 mm. ..... *Megaphragma* Timberlake, 1923
- Body not dorso-ventrally flattened; forewing not extraordinarily narrow nor shaped as a flattened sigmoid 2
2. Female club 5-segmented; antenna without a funicle 3
- Female club of less than 5 segments, funicle present or absent 7
3. Antennal club with large, forward-curving spines, some of them are branched ..... *Haeckeliania* Girault, 1913
- Antennal club without large, branched and forward-curving spines 4
4. Antennal scape impressed to receive the large, globular and spinose pedicle; basal 4 segments of club fused into a large hemispherical structure bearing stout spines from which the apical club segment is produced as a cylindrical projection bearing several long setae ..... *Hispidophila* Viggiani, 1968
- Antennal segments not so peculiarly formed, normal, the club more or less spindle-shaped with distinct and transversely divided segments 5
5. Vein track RS_1 absent; club with an apical process ..... *Lathromeris* Förster, 1856
- Vein track RS_1 present; club without an apical process 6
6. Maxillary palpus of single segment; forewing elongate, rounded distally; marginal vein much longer than stigmal vein; vein tracks conspicuously converging near apex of retinaculum. ..... *Lathromeroidea* Girault, 1912
- Maxillary palpus 2-segmented; forewing very broad, oblately rounded distally; marginal vein as long as stigmal vein; vein tracks not conspicuously converging near apex of retinaculum ..... *Ophioneurus* Ratzeburg, 1852

7. Marginal vein of female failing to touch anterior border of forewing, or the costal cell extraordinarily elongated and extending distally at least one-half the total length of the wing blade ..... *Poropoea* Förster, 1851
- Marginal vein of female coinciding with anterior border of forewing 8
8. Forewing disc with the microtrichiae beyond venation short, abundant and dense, randomly distributed or seldom arranged in lines; the abundance of these discal cilia on forewing resembles that usually seen in other families of Chalcidoidea 9
- Forewing disc without such an abundance of short, dense microtrichiae; instead discal cilia may be sparse, nearly lacking, or if present then usually arranged in lines or with several complete vein tracks; if not arranged in lines then the discal cilia are not so abundant, dense and short 10
9. Funicle 2-segmented, cylindrical and distinctly separated, club of 2 segments not broadly joined; ovipositor distinctly exserted ..... *Probrachista* Viggiani, 1968
- Funicle absent; club of 2 segments broadly joined ..... *Aphelinoidea* Girault, 1911
10. Female club with single segment, funicle with 2 segments 11
- Female club with more than 1 segment 12
11. Vein track RS_1 present, male club with single segment ..... *Trichogramma* Westwood, 1833
- Vein track RS_1 absent; male club with 3 segments ..... *Trichogrammatoidea* Girault, 1911
12. Funicle with 1 segment 13
- Funicle absent, or 2-segmented 14
13. Antennal club 3-segmented; forewing elongate, discal cilia sparse or near lacking; marginal vein long, straight, much longer than stigmal vein ..... *Oligosita* Walker, 1851
- Antennal club 1- or 2-segmented; fore wing somewhat ovoid, pointed apically, discal cilia entirely devoid ..... *Epoligosita* Girault, 1916
14. Funicle absent, female club 2- or 4-segmented 15
- Funicle present or absent, female club 3-segmented (sometime 4-segmented in male) 18
15. Club 2-segmented; second segment slender; maxillary palpus 2-segmented ..... *Eutrichogramma* gen. nov.
- Club 4-segmented; maxillary palpus only 1 segment 16
16. Vein track of RS_1 absent, marginal vein of forewing long, straight, marginal fringe long 17
- Vein track of RS_1 present, marginal vein of forewing and marginal fringe short ..... *Uscana* Girault, 1911
17. Forewing shaped as in subgenus *Zorontogramma* of *Oligosita*, never broad at apex ..... *Lathromeromyia* Grault, 1914
- Forewing rounded and broadened at apex ..... *Girauliola* Nowicki, 1936
18. Valvifers very elongated within abdomen, often penetrating deeply into thorax; ovipositor very long, frequently very greatly exserted 19
- Valvifers not so elongated within abdomen, normal; ovipositor not so extraordinarily developed 20
19. Maxillary palpus of 2 segments, first funicle nearly trapezoid, slightly smaller and distinctly separated from the second; marginal vein of forewing rather short, vein track RS_1 absent, marginal fringe long. ..... *Prochaetostricha* gen. nov.
- Maxillary palpus of 1 segment; first funicle segment small, scale-like, broadly joined, second funicle long, cylindrical; marginal vein of forewing long, vein track RS_1 present, marginal fringe short ..... *Chaetostricha* Walker, 1851
20. Forewing elongated, rounded distally; discal cilia abundant or sometime arranging on several

vein tracks, vein track RS_1 may or may not be present, base of premarginal vein smooth, narginal vein long, straight ..... *Paracentrobia* Howard, 1897

– Forewing broadly oblate distally, discal cilia distinctly arranging on vein track, basal vein track and radial process conspicuously present 21

21. Maxillary palpus of 2 segments ; each funicle segment longer than wide, cylindrical, distinctly separated ..... *Mirufens* Grault, 1915

– Maxillary palpus of 1 segment ; first funicle shorter and broadly joined to the second, ... *Ufens* Girault, 1911

Genus ***Ufens*** Girault

Ufens Girault, 1911. Trans. Amer. Ent. Soc. 37 : 32-35. Type-species : *Trichogramma nigrum* Ashmead. Original designation. Centralia, Illinois.

Ufensia Girault, 1913. Mem. Queensl. Mus. 2 : 101. Type-species : *Ufensia pretiosa* Girault. Original designation. (Redescribed as new genus by Girault, with same genotype, in Proc. Ent. Soc. Wash. 16 : 118, 1914)

Neocentrobia Blood, 1923. Ann. Rept. Proc. Bristol Nat. Soc. 2 : 101. Nom. nud.

Neocentrobia Blood and Kryger, 1928. Ent. Meddel. 16 : 203. Preocc. by Girault, 1912. Type-species : *Neocentrobia hirticornis* Blood and Kryger. Original designation.

Stephanotheisa Soika, 1931. Natuurh. Maandbl. 20 : 111. Type-species : *Stephanotheisa vitoldi* Soika. Monotypic.

Grantanna Girault, 1939. Ohio Jour. Sci. 39 : 324. New name for *Neocentrobia* Blood and Kryg nec Girault.

Ufens is a large and worldwide distributed genus. The characteristic structures of this genus by the presence of the forewing very broad oblate and nearly truncate apically, marginal fringe are very short, marginal vein short, stigmal vein is as long as the marginal vein, with very distinct vein tracks. Female antenna has 2 small annelli, the 2 funicle segments are obliquely divided but with junction confused, club 3-segmented. Male antennal club 4-segmented with whorls of curved bristles, terminal segment is very small.

Two undescried species have been discovered in Taiwan.

Genus ***Mirufens*** Girault

Mirufens Girault, 1915. Mem. Queensl. Mus. 3 : 147. Type-species : *Mirufens dentipes* Girault. Original designation. Queensland.

Trachocera Blood and Kryger, 1928. Ent. Medd. 16 : 208-209. Type-species : *Asynacta longicauda* Blood, 1923=*Trachocera longicauda* Blood and Kryger, 1928.

Mirufens is a small genus and distributed in Queensland, Sri Lanka, Syria and Europe. Three species have been described. Doutt and Viggiani (1968) divided into 2 subgenera. In the subgenus *Mirufens* (s. s.) marginal vein of female fails to attain the anterior border of forewing, and a distinct break between the premarginal and marginal veins. The stigmal vein much longer than either premarginal or marginal vein. The subgenus *Mirufens* (s. s.) in known from Queensland and Sri Lanka. The specimens known of subgenus *M.* (*Trachocera*) are from Europe and Syria. They are separated from the subgenus *Mirufens* (s. s.) by the marginal vein touches the border of forewing, and by the more elongate club and funicle segments. The female antenna has a distinctly ridged pedicel, 2 annelli, 2 distinctly quadrate and

articulate funicle, and long pointed 3-segmented club. The male antenna is quite different with long forward-curving bristles arranged in whorls on the flagellar segments.

Only one undescribed species has discovered as a parasite of the eggs of *Chunvocerus niveosparsus*, Cicadellidae, which attacked the Mango trees in Taiwan.

Genus ***Poropoea*** Förster

Poropoea Förster, 1851. Verh. naturh. Ver. preuss. Rheinl. 8 : 28. Type-species : *Poropoea stollwerckii* Förster. Monotypic. Germany.

Poropoeoides Nowicki, 1936. Zeit. angew. Ent. 23 : 125-26. Type-species : *Poropoeoides bohemica* Nowicki. Original designation. Poland.

Poropoea widely distributed in Europe, Poland, Italy, India, Sumatra, Japan and U. S. A. Nine species have been described, they are the egg parasites of attelabid beetles. The characteristic structures of this genus in having the body stout and strongly convex, ovipositor very long, and the strongly sigmoid venation which fails to attain the anterior margin of forewing. The female antenna has 2 large, cylindrical, and articulated funicle segments with a tapering, 3-segmented club. The male has the same segmentation in the club but with segments less stout.

Only one undescribed species has been discovered in Taiwan.

Genus ***Ophioneurus*** Ratzeburg

Ophioneurus Ratzeburg, 1852. Ichneumo der Forstinsekten 3 : 196. Type-species : *Ophioneurus signatus* Ratzeburg. Designated by Gahan and Fagan, 1923. Germany.

Mooa Girault, 1930. New Pests from Australia 7 : 2. (Privately published). Type-species : *Mooa nigrivena* Girault. Original designation.

Ophioneurus is a rather small genus which distributed in Europe and Queensland. There are 4 species have been described. Its structures is characteristic by the presence of greatly widened and oblate apex of forewing with short venation, marginal vein shorter than premarginal vein, stigmal vein broad; wing disc with cilia marked the important vein tracks. Maxillary palpus with 2 segments ; antennal club with 5 segments and sharply pointed apically, funicle absent.

Only one undescribed species has been discovered in Taiwan.

Genus ***Lathromeroidea*** Girault

Lathromeroidea Girault, 1912. Mem. Queensl. Mus. 1 ; 94. Type-species : *Lathromeroidea nigra* Girault. Original designation. Herberton, North Queensland.

Centrobiopsis Girault, 1918. North Amer. Hym. Trichogrammatidae: 4, 7. (Privately published). Type-species : *Centrobia odonatae* Ashmead. Original designation.

This genus distributed in Queensland, Brazil, Eastern United States of America and Poland. Five species have been described. Its structures is characteristic by the presence of an unusual and conspicuous convergence of the base of vein tracks RS_1, M, Cu and A. Forewing is long and moderately wide, with narrow base and round apex. Antenna with 2 annelli and lacking funicle, club 5 segments, with forward curving spines and both pedunculate and elongate sensor ia.

Only one undescribed species of this genus has been discovered. It was found rather abundant on the grass and parasitized the eggs of *Nephotettix cincticeps*, Cicadellidae, which attacked the rice plant in Taiwan.

Genus ***Lathromeris*** Förster

Lathromeris Förster, 1856. Hymenopterologische Studen 2 : 82. Type-species : *Lathromeris scutellaris* Förster. Original designation. Germany.

Lathromerella Girault, 1912. Mem. Queensl. Mus. 1 : 93. Type-species : *Lathromerella fasciata* Girault. Original designation.

Garouella Risbec, 1956. Bull. Inst. Fr. Afr. Noire, A 18 : 818. Type-species : *Garouella ovicida* Risbec. Original designation.

Lathromeris is a large genus and widely distributed in Europe, Africa, Australia, South America and North America. It is characteristic by the presence of a 2 small annelli which the second is scale-like and appressed to the first, lacking funicle segment, the club large, with 5 segments, the basal segment rather small of which may resemble a funicle segment, apical club segment frequently terminates in a rod-like spicula. The marginal vein of forewing is long and the vein track RS_1 is absent.

One undescribed species has been discovered in Taiwan.

Genus ***Hispidophila*** Viggiani

Hispidophila Viggiani, 1968. Proc. Calif. Acad. Sci. 4 ser. 35(20) : 503. Type-species : *Haeckeliania brontispae* Ferriere. Original designation. Java, South Celebes.

Hispidophila distributes in Java, South Celebes and Malaya. Only the type species has been reported parasitizing into the eggs of hispid beetles, Chrysomalidae, which fed upon the foliage of coconuts. The characters of this genus by the presence of the maxillary palpus 1 segment, antenna with short scape, its lower surface depressed formed a wide concavity which receive the large pedicel, the 2 annelli are small, club with 5 segments, the basal 4 segments broadly, obliquely fused each other and formed a large globosity, the apical segment elongate and pointed apically. Forewing long, rounded apically, marginal vein long and with a cluste thick setae, stigmal vein long, the slightly distinct vein tracks are a distinictive features.

Only one undescribed species has been discovered in Taiwan.

Genus ***Haeckeliania*** Girault

Haeckeliania Girault, 1912. Mem. Queensl. Mus. 1 : 97-98. Type-species : *Haeckeliania haeckeli* Girault. Original designation. Herberton, North Queensland.

Haeckeliania is merely distributed in Queensland and 4 species have been described. The characters of *Haeckelinania* by the presence of the small and stout body. Maxillary palpus with 2 segments ; antenna with 2 annelli, funicle segment absent, club with a particularly complex 5-segmented, and bering large, gross, forward-curving spines that may be branched. Forewing moderately broad, marginal vein slightly shorter than premarginal, vein track RS_1 converging with the anterior portion of vein track Cu.

Only one undescribed species has been found in Taiwan.

Genus ***Prochaetostricha*** Lin, gen. nov.

Type-species : *Prochaetostricha monticola* Lin, sp. nov. Present designation.

Body stout. Head normal, genal suture lacking, maxillary palpus 2-segmented; antennal formula with a single rather large annellus which dorsal surface with a seta, and 2 distinctly separated funicle; female with 3-segmented club, rather abundant cilia and linear sensoria, second and third segments are incompletely separated, third segment with an apical projection; male antenna with long and sparse bristles, 4-segmented club and very small apical segment. Forewing broad, rounded distally, marginal fringe long, marginal vein shorter than either premarginal or stigmal veins, disc with sparse cilia, vein track distinct except RS_1 absent. Valvifers very elongated within abdomen and penetrating deeply in thorax, ovipositor sheath exserted, very long and upcurved.

Prochaetostricha is characteristic by the forewing, antennal formula and the long ovipositor those are easily distinguished from *Chaetostricha* Walker in the previous key.

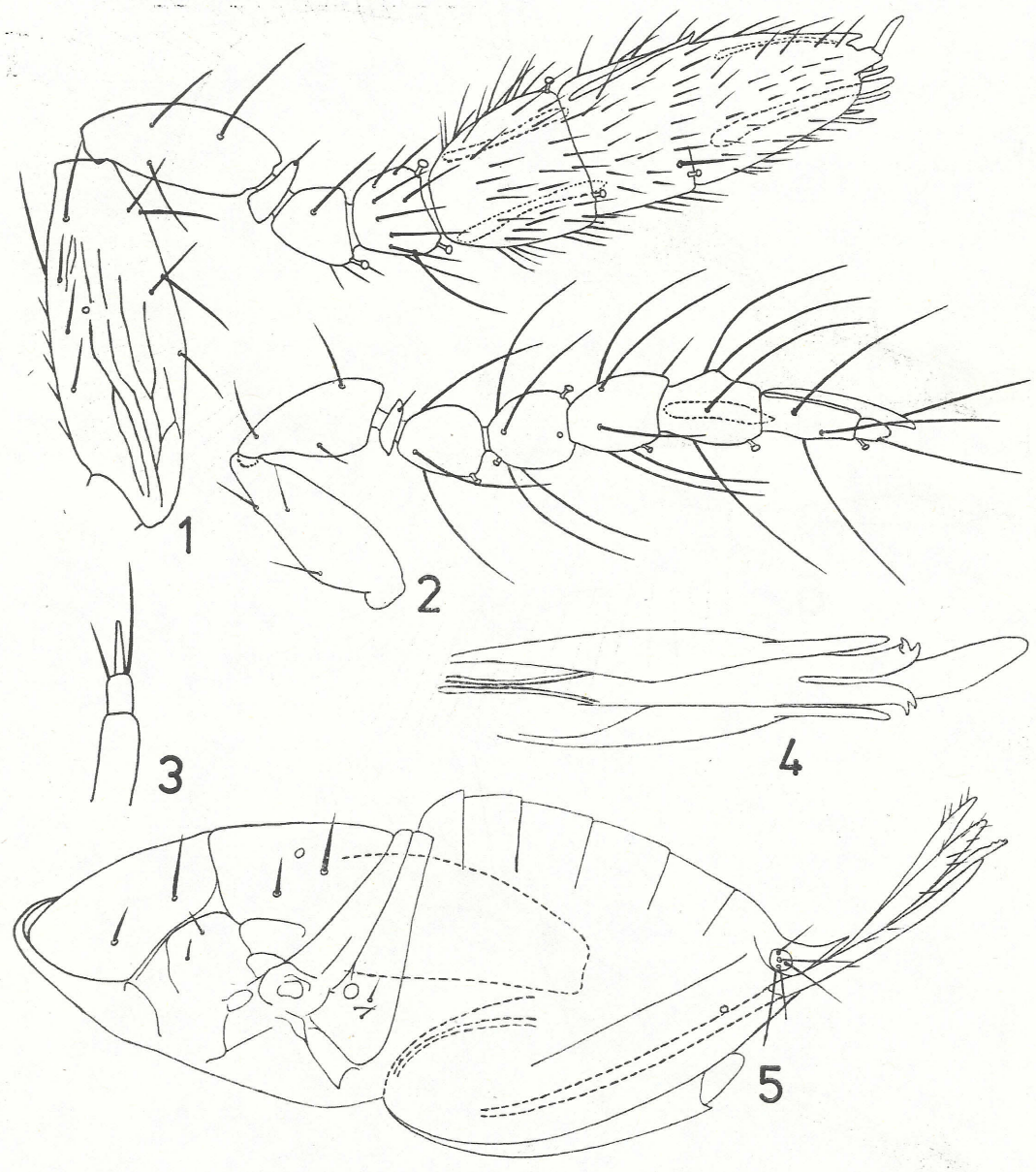
Prochaetostricha monticola Lin, sp. nov.
(Figs. 1-7)

Female. Brownish-black, eyes reddish, antennal club I and apical portion of tibia lighter ; wing hyaline, basal 1/2 of forewing infuscate, venation brownish, apex of premarginal vein lighter; submarginal vein, radial process, beneath of premarginal, marginal veins and pterostigma slightly darker.

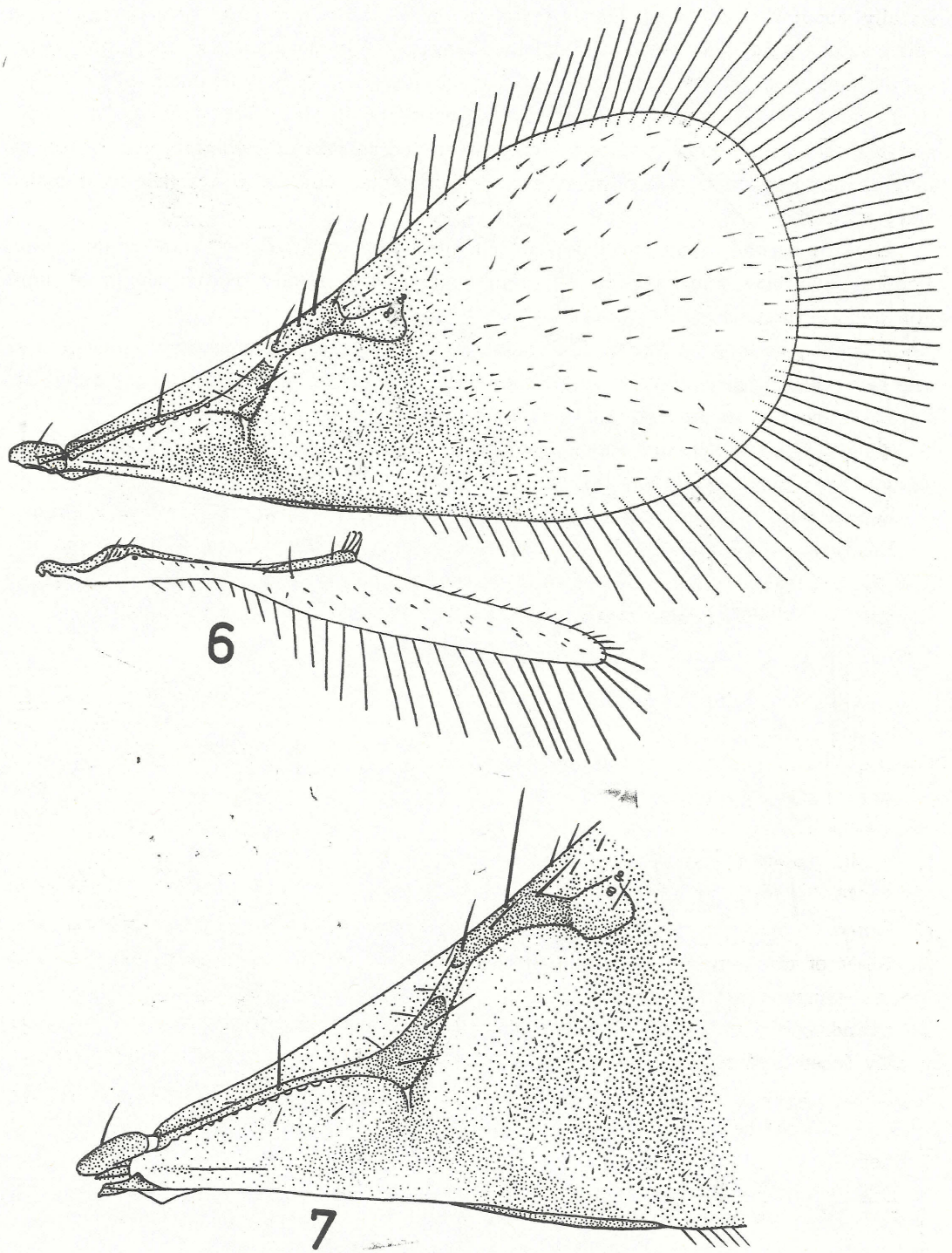
Body stout. Head suboblated, shorter than wide (0.8x) in frontal view; eyes moderately large, with sparse cilia; lateral ocellus lying close to eye and its interspace as long as ocellus diameter; malar space 1/3 as long as high of eye and genal suture absent; mandible with 3 very sharped outer teeth, the inner one broad and truncate apically ; maxillary palpus 2-segmented, basal one broad and about 4.6x as long as the segment II, segment II narrow; labial palpus 1-segmented, similar to the segment II of maxillary palpus; antenna inserted at under level of lower margin of eye; scape reaching to median ocellus, laterally compressed, 2.8x as long as wide, with setae and longitudinal, irregular sculptures; pedicel 0.4x as long as scape; annellus only 1 segment, rather large, with 1 dorsal seta; funicle with 2 separated segments, funicle II distinctly larger than I and with setae lying on 2 section; club with 3 segments but segment II and III not completely separated, distinctly longer and wider than scape, with abundant cilia, I, II and III segments with 2, 1 and 2 linear sensoria respectively, segment III with an apical process.

Pronotum short and declivous anteriorly; mesoscutum moderately convex, scutellum weakly convex, both with longitudinal irregularly reticulated sculptures and each with 2 setae laterally ; relative length of mesoscutum, scutellum, metanotum and propodeum about 18, 13.5, 1 and 2.5 ; spiracle of propodeum rounded, with 3 cilia on spiracle behind; mesopostphragma reaching to half of abdomen.

Forewing about 1.6 longer than wide and rounded apically, with venation extending



Figs. 1-5. *Prochaetostricha monticola* gen. et sp. nov. 1, antenna of female ; 2, antenna of male ; 3, maxillary palpus ; 4, male genitalia ; 5, body in lateral view.



Figs. 6–7. *Prochaetostricha monticola* gen. et sp. nov. 6, wings of male ; 7, basal half of forewing, female.

distally about 0.53 of wing blade; costal cell wide and with 3 cilia near premarginal vein; submarginal vein equal to combined length of premarginal and marginal veins, with 1 long seta at its midlength; base of premarginal vein wider than apex, with 2 cilia; radial process present; marginal vein distinctly shorter than premarginal vein, straight and with 1 long seta and 3 cilia on its dorsal surface; stigmal vein broad, as long as marginal vein, pterostigma large, subquatrate; cilia on wing blade as in male; marginal fringe long.

Legs moderately long and hairy, with longitudinal irregular reticulate sculptures on femora and tibiae, and irregular reticulate sculptures on coxae; relative length of hind tiba and its tarsus about 26, 7, 6, 6.

Abdomen as long as thorax and more or less laterally compressed, smooth and with few cilia, valfifers very elongated within abdomen and penetrating deeply in thorax; ovipositor sheath exserted, very long and upcurved.

Male. Similar to female; antenna with long setae as Fig. 2, club 4-segmented, apical segment very small; wings as Fig. 6, pterostigma subtriangular.

Female body 1.5 mm., forewing 1.5 mm.; male body 0.85 mm., forewing 1.1 mm.

Holotype. ♀(#14530) TAIWAN Central, Meifeng, 2,150m, Nantou Hsien, 20-22. VI. 1979, K. S. Lin and B. H. Chen (both of forewings apically and hindwing are distorted) Allotype. ♂ (#14520) same locality but collected on 18. VII. 1979, K. C. Chou.

Genus ***Chaetostricha*** Walker

Chaetostricha Walker, 1851. Ann. Mag. Nat. Hist. (2) 7 : 211. Type-species : *Chaetostricha dimidiata* Walker. Monotypic. Holywood, North Ireland.

Centrobia Förster, 1856. Hymenopterologische Studien 2 : 87. Type-species : *Calleptiles walkeri* Förster. Original designation.

Centrobiella Girault, 1912. Mem. Queensl. Mus. 1 : 90. Type-species : *Centrobiella mulierum* Girault. Original designation.

Ratzeburgalla Girault, 1938. Rev. Ent. Rio de Janeriro 8 : 80.

Chaetostricha is a large genus and worldwide distributed. The characteristic structures of this genus is by the presence of 2 small annelli, 2 funicle segments and with an elongate tapeing 3-segmented club, the second segment of funicle is very long and cylindrical, much longer than the first one, first segment somewhat scale-like and broadly fused with the second segment. Forewing rounded distally with marginal fringe moderately short, marginal vein long and straight, stigmal vein usually distinctly constricted, and the vein tracks conspicuously completed. Ovipositor long and usually exserted.

One undescribed species has been discovered in Taiwan. It occurred rather abundant on the weeds.

Genus ***Paracentrobia*** Howard

Paracentrobia Howard, 1897. Jour. Linn. Soc. London Zool. 26 : 178. Type-species : *Paracentrobia punctata* Howard. Monotypic. Grenada, West Indies.

Abbella Girault, 1911. Trans. Amer. Ent. Soc. 37 : 9-11. Type-species : *Abbella subflava* Girault.

Original designation.

Jassidophthora Perkins, 1912. Bull. Expt. Stn. Hawaiian Sugar Planters' Assoc., Ent. Ser., 10 : 17. Type-species : *Jassidophthora prima* Perkins. Monotypic.

Abbellisca Ghesquiere, 1946. Rev. Zool. Bot. Afr. 39 : 371. New name for *Abbella* Girault nec Heyden.

This genus is a large, abundant and cosmopolitan. Antnnal annellus with 2 segments, funicle with 2 segments which are distinctly separated or broadly joined, club elongate, with 3 segments. Forewing long and rounded distally, with moderately short marginal fringe, wing blade with abundant discal cilia or with distinct vein tracks. Doutt and Viggiani (1968) divided this genus into 3 subgenus : The subgenus *Ittys* has 2 funicle elongate and distinctly separated those are different from the 2 other subgenus, and the wing disc with distinct vein tracks. The subgenus *Brachistella* having forewing disc covered with short, randomly distributed cilia, without complete and distinct vein tracks; and the forewing of the subgenus *Paracentrobia* (s. s.) having somewhat sparse cilia more or less arranged in a few lines, substigmal spot usually present.

There are 4 species of the genus have been discovered in Taiwan, *P. (Brachistella) andoi* is common, abundant in summer and autumn which are parasitized into the eggs of the rice leaf hopper, *Nephotettix cincticeps* or the other cicadellids on the grass. Another 3 species of the subgenus *Paracentrobia* (s. s.) are not as common as *P. andoi*.

Genus ***Uscana*** Girault

Uscana Girault, 1911. Trans. Amer. Ent. Soc. 37 : 22-23. Type-species : *Uscana semifumipennis* Girault, Origiaal designation. Beeville, Texas.

Bruchoctonus Grese, 1923. Bull. Saratov Seed Select Admin. Sugar Trust, Kiev, 7 : 117. Type-species : *Bruchoctonus senex* Grese.

Uscana is a large, worldwide genus. The characteristic structures of this genus by the antenna with 4-segmented club in both sexes bears long setae and both pedunculate and linear sensoria, funicle segment absent. Forewing broadly rounded distally, under the venation infuscate, marginal vein straight and slightly short, vein tracks distinct, marginal fringe short. Ovipositor notably short and often no more than one-third the length of abdomen, and originates posteriorly to the middle of abdomen.

Only one undescribed species has been found in Taiwan.

Geuns ***Lathromeromyia*** Girault

Lathromeromyia Girault, 1914. Zeits. Wiss. Insektenbiol 10 : 308. Type-species : *Lathromeromyia perminuta* Girault. Original designation. Pasoeroean, Java.

Lathromeromyia is a small genus, it descributed to Java, Cameroons and South Africa. The characteristic structure can be recognized by the presence of antennal club 4-segmented, lacking funicle segment, annellus small, shape of forewing similar to the subgenus *Zorontogramma* of *Oligosita* by having marginal vein distinctly longer than premarginal vein, Forewing blade with sparse cilia, lacking vein track RS_1.

Two undescribed species have been discovered in Taiwan.

Genus *Giraultiola* Nowicki

Giraultiola Nowicki, 1936. Zeit. angew. Ent. Berlin 23 : 136. Type-species : *Brachysticha fidiae* Ashmead. Original designation. Euclid, Ohio, U. S. A.

Giraultia Steffan, 1954. Bull. Mus. Hist. Nat. Paris 26 : 669. (Lapsus for *Giraultiola* Nowicki).

Only the type species of this genus was known. This genus can be recognized by the presence of club of antenna 4-segmented, without an annellus and funicle. Forewing with distinctly rounded and broadened apex, vein tracks more or less present but lacking RS_1.

Only one undescribed species has been discovered in Taiwan.

Genus *Trichogrammatoidea* Girault

Trichogrammatoidea Girault, 1911. Trans. Amer. Ent. Soc. 37 : 13-15. Type-species : *Chaetosticha* (sic) *nana* Zehntner. Original designation. Java.

Trichogrammatoidea is a large genus and worldwide distributed. Its habits are resembled to *Trichogramma*. The characteristic structures can be recognized by the presence of the 3-segmented male club, long stigmal vein, absence of vein track RS_1 and the moderately long marginal fringe those are distinctly separated to *Trichogramma*.

There are 2 species recorded from Taiwan, *T. nana* attacked the eggs of *Chilo infuscatellus*, *Eucosma schistaceana* and *Diatraea venosata*, and *T. bactrae* parasitized the eggs of *Eucosma* sp. on sugarcane.

Genus *Trichogramma* Westwood

Trichogramma Westwood, 1833. Phil. Man. 2 : 444. Type-species : *Trichogramma evanescens* Westwood. Monotypic. England.

Calleptiles Haliday, 1833. Ent. Mag. 1 : 340. Type-species : (*Calleptiles latipennis* Haliday. Monotypic) =*Trichogramma evanescens* Westwood.

Pentarthron Packard, 1872. Rec. Amer. Ent. 1871 : 8. Type-species : *Trichogramma minuta* Riley. Monotypic.

Aprobosca Westwood, 1878. Trans. Linn. Soc. London, Zool. 1 : 592. Type-species : *Trichogramma* (*Aprobosca*) *erosicornis* Westwood. Monotypic.

Oophthora Aurivillius, 1898. Ent. Tidskr. 18 : 250. Type-species : (*Oophthora semblidis* Aurivillius. Monobasic) =*Trichogramma evanescens* Westwood.

Xanthoatomus Ashmead, 1904. Mem. Carnegie Mus. 1 : 360. Type-species : *Xanthoatomus albipes* Ashmead. Original designation.

Neotrichogramma Girault, 1911. Trans. Amer. Ent. Soc. 37 : 38-39. Type-species : *Neotrichogramma acutiventre* Girault. Original designaion.

Trichogrammatana Girault, 1932. New lower Hymenoptera from Australia and India : 1. (Privately published). Type-species : *Trichogamma* (*Trichogrammatana*) *singularis* Grault. Monotypic.

Trichogramma is large and worldwide distributed genus, expecially common in Holarctic region and parasitized the eggs of most Lepidoptera which are important pests of the agriculture and forestry. Some species have been used as the biological control agents of the major pests in different parts of the world.

Body short compact, forewing venation has often been platly sigmoid because the distal curvature at the end of the marginal vein onto the stigmal vein does form a shallow "S" with the curved premarginal vein. forewing broadly rounded with distinct vein tracks. Female with solid club obliquely truncate distally, fumicle 2-segmented; the male club elorgate and irregularly surfaced with whorls of setae which are distinguishable from *Trichogrammatoidea*.

Trichogramma australicum Girault, *T. chilonis* Ishii, *T. dendrolimi* Mats. and *T. japonicum* Ashmead have often been discovered in this island which parasitized the eggs of the major pests mostly of the Lepidoptera attacking rice plant , sugarcane, forest, etc.

Genus ***Probrachista*** Viggiani

Probrachista Viggiani, 1968. Proc. Calif. Acad. Sci. 4 ser. 35(20) : 521. Type-species : *Probrachitsa nepalensis* Viggiani. Original designation. Taplejung District, Sangu, Nepal.

Only one species of *Probrachista* has been found in type locality. The characteristic structures of this genus can be recognized by the presence of the genal suture present, maxillary palpus with only 1 segment, antenna with either scape or pedicel elongate, with 1 small annellus, 2 cylindrical funicle segments are distinctly separatted, and with 2 elongate club. Forewing elongate, basally narrow and apically rounded. venation distinctly short, marginal vein long and straight, stigmal vein short, the disc with abundant microtrichia and the marginal fringe are short.

Only one undescribed species has been found in Taiwan.

Genus ***Eutrichogramma*** Lin, gen. nov

Type-species : *Eutrichogramma elongatum* Lin, sp. nov. Present designation.

Body stout. Head normal, lacking genal suture; maxillary palpus 2 segments; antennal formula with a single annellus, lacking funicle segment, with 2 elongate club, basal segment broad basally, with whorls linear sensoria and long setae, second segment narrow and cylindrical, with linear sensoria and an apical long projection. Forewing broadened apically, marginal fringe long, marginal vein moderately long, straight, stigmal vein broad, discal cilia sparse, vein tracks RS_1 and base of RS_2, r-m, M and Cu_1 inconspicuous. Ovipositor long.

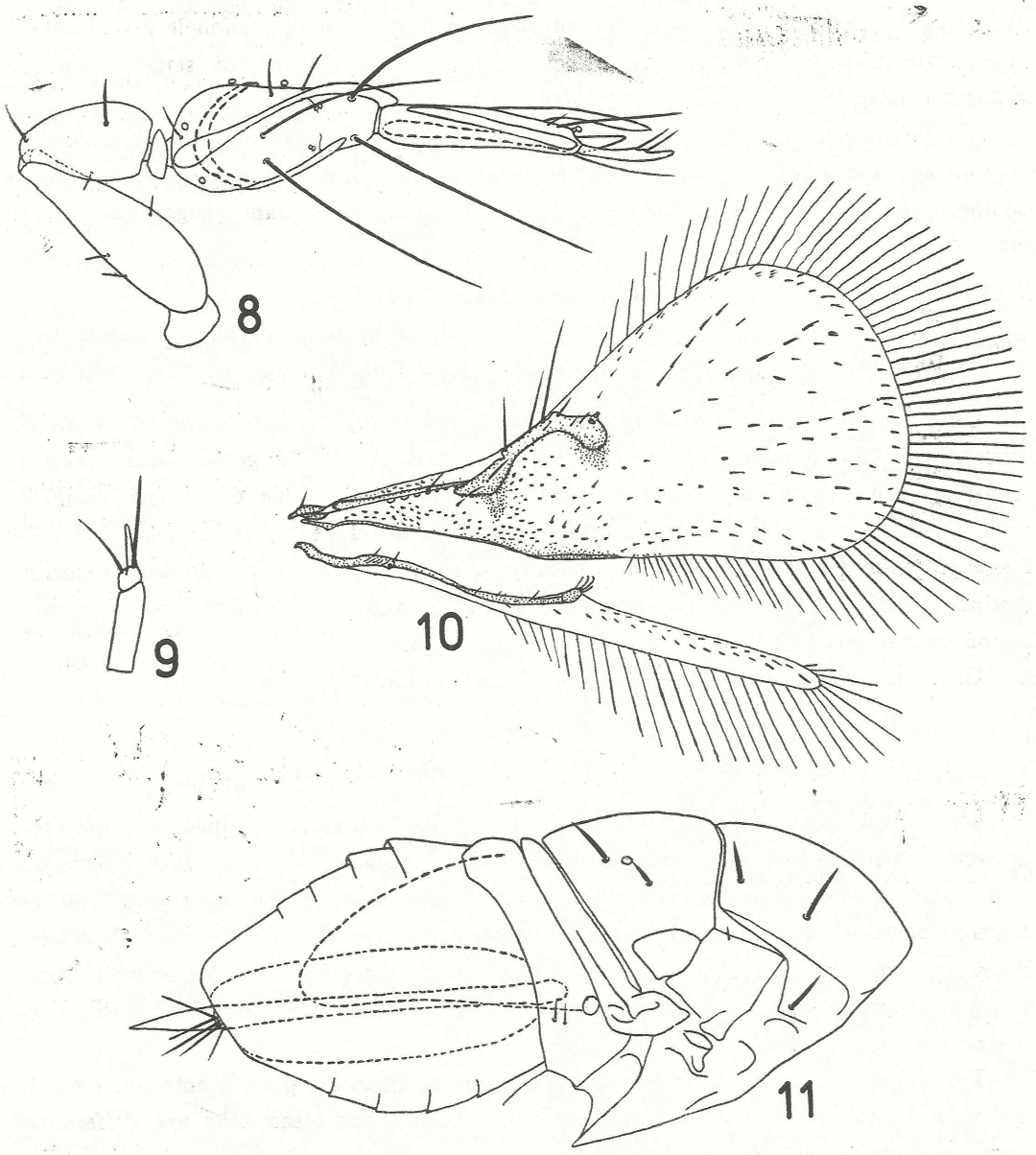
This genus can be recognized by the characters of maxillary palpus, antennal formula and with its appendix, the form of forewing, venation and discal cilia are differented from the other genera of Trichogrammatidae.

Eutrichogramma elongatum Lin, sp. nov.

(Figs. 8-11)

Female. Brown-black, eyes reddish, antennal scape and 2 basal tarsal segments lighter, wing hyaline, basal portion of forewing and beneath pterostigma infuscate, venation brownish.

Head shorter than wide in frontal view (0.8x), suboblated; eyes moderately large,



Figs. 8–11. *Eutrichogramma elongatum* gen. et sp. nov., female. 8, antenna ; 9, maxillary palpus ; 10, wings ; 11, body in lateral view.

sparse cilia; lateral ocellus lying close to eye, its interspace less than ocellar diameter; malar space about 0.6x as long as high of eye, genal suture absent; mandible with 3 very sharped outer teeth and the inner one broad and truncate; maxillary palpus 2-segmented, basal one about 4x as long as apical segment, apical segment distinctly narrow; labial palpus with a single segment which is short but little longer than wide; antenna inserted at level of lower margin of eye; scape reaching to median ocellus with apical portion distinctly narrow; pedicel about 0.6x as long as scape; annellus with single segment; funicle segment absent; club 2 segments, club I distinctly broaded basally, with 2 whorls linear sensoria and long setae on median and apical section, club II very narrow and delicate, slightly shorter than club I, with 2 linear sensoria, apical part with a distinct process.

Thorax compact, pronotum very short and declivous anteriorly; mesoscutum moderately convex, longer than scutellum (1.3x), scutellum weakly convex, both with longitudinal reticular sculptures and 2 setae on laterally; metanotum short, propodeum slightly long, both are nearly smooth; mesopostphragma reaching the 3/4 of abdomen.

Forewing about 2x as long as wide, broadened apically, venation extending midlength of wing blade; submarginal vein longer than marginal vein; premarginal vein slightly shorter than marginal vein, subtriangular and stout, radial process present; marginal vein straight and with 3 setae, stigmal vein broad, as long as marginal vein; pterostigma rounded; disc with sparse cilia, vein tracks R, RS_2, r-m, M, Cu_1 and Cu_2 are present, vein track RS_1 absent, marginal fringe long, less than 1/2 of greatest width of wing blade; hingwing very narrow, with 2 rows of cilia on disc, marginal fringe about 1/5 in wing length.

Legs moderately long and hairy, hind coxae distinctly longer than other, outer surface with uniseriate longitudinal microgranularity.

Abdomen as long as thorax, smooth, slightly point posteriorly, ovipositor long, from base of abdomen and exserted apically.

Length of body 0.8 mm., forewing 0.9 mm.

Male. Unknown.

Holotype. ♀(#13658) TAIWAN Central, Kukuan, 730 m, Taichung Hsien, 20-22. VI. 1978. K. S. Lin and K. C. Chou.

Genus ***Aphelinoidea*** Girault

Aphelinoidea Girault, 1911. Trans. Amer. Ent. Soc. 37 : 2-4. Type-species : *Aphelinoidea semifuscipennis* Girault. Original designation. Centralia, Illinois.

Krygeriola Nowicki, 1934. Polsk. Pismo Ent. 12 : 3-4. Type-species : *Krygeriola dolichoptera* Nowicki. Original designation.

Lengerkeniola Nowicki, 1946. Zbl. Ges. Geb. Ent. 1 : 45. Type-species : *Lathromeroides (Lengerkeniola) bischoffi* Nowicki. Original designation.

Tanygramma De Santis, 1957. Notas del Museo, La Plata Univ. 19 : 37-38. Type-species : *Tanygramma xiphias* De Santis. Original designation.

Aphelinoidea is a large genus and worldwide distributed. The characteristic

structures of this genus by the presence of the antennal funicle segment absent and with 2 club segments broadly fused which resemble a spindle. Forewing elongate and rounded apically, disc with short abundant microtrichiae, vein tracks indistinct, the venation short, marginal vein broad and shorter than submarginal vein and stigmal vein very short.

Only one undescribed species has been discovered in Taiwan which is slightly abundant on the grass.

Genus ***Oligosita*** Walker

Oligosita Walker, 1851. Ann. Mag. Nat. Hist. (2) 7 : 212-213. Type-species : *Oligosita collina* Walker. Monotypic. Ireland.

Westwoodella Ashmead, 1904. Mem. Carnegie Mus. 1 : 359. Type-species : *Oligosita subfasciata* Westwood. Original designation.

Paroligosita Kurdjumov, 1911. Rev. Russe d'Ent. 11 : 434. Type-species : *Paroligosita bella* Kurdjumov. Original designation.

Pseudoligosita Girault, 1913. Mem. Queensl. Mus. 2 : 104. Type-species : *Pseudoligosita arnoldi* Girault. Original designation.

This genus is a very large, abundant and cosmopolitan. The characteristic structures by the presence of the antennal formula with a single annellus, a single elongate funicle and an elongate 3-segmented club frequently terminating in a rod-like projection. Forewing are narrowly rounded and wing disc is somewhat nearly devoid cilia, and marginal fringe are frequently very long.

In Taiwan, 5 species have often been discovered at lowland on the grass, weeds and rice field. Two abundant species parasitized the eggs of *Nephotettix cincticeps* which attacked rice plant.

Genus ***Epoligosita*** Girault

Paroligosita Girault and Dodd, 1915. Mem. Queensl. Mus. 3 : 145. Type-species : *Paroligosita biclavata* Girault and Dodd. Original designation.

Epoligosita Girault, 1916. Mem. Queensl. Mus. 5 : 206. New name of *Paroligosita* Girault and Dodd.

Epoligosita is a small genus, 2 species are described, and distributed in Queensland and South Africa. The characteristic structures by the presence of the forewing are almond shaped, disc cilia entirely absent, marginal fringe long, with long venation reaching beyond the midlength of wing blade, and marginal vein long and straight. Antenna with short scape, a single small annellus, a single funicle segment and club with 1 or 2 segments.

One undescribed species has been discovered in Taiwan.

Genus ***Megaphragma*** Timberlake

Megaphragma Timberlake, 1924. Proc. Hawaii. Ent. Soc. 5 : 413. Type-species : *Megaphragma mymaripenne* Timberlake. Original designation. Oahu, Hawaii.

Sethosiella Kryger, 1932. Bull. R. Soc. Ent. Egypte 1932 : 38. Type-species : *Sethosiella priesneri*

Kryger. Original designation. Tanta, Egypt.

Megaphragma are known to distributed comprising Hawaii, U. S. A., Haiti, Egypt, Zaire and South Africa. Three species have been described and each has been found associated with thrips.

The characters of this genus by the presence of the forewing distinctly narrow, peculiarly shaped as a plattened sigmoid with marginal fringe on both wings are very long ; body is small in size, distinctly broadened ; the antenna with a single annellus, a single funicle and 2 club segments.

One undescribed species has been reared from the eggs of *Empoasca formosana* Paoli, Cicadellidae on tea plant, *Thea sinensis* in Taiwan which antenna lacking funicle segment, club with 3-segmented, the basal one broadly and obliquely fused with club II, forewing discal cilia absent and body about 0.22 mm. in length.

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臺灣毛小蜂科之分屬及2新屬新種之記載[1]

林 珪 瑞[2]

中 文 摘 要

本文依據大部分以掃網採得之毛小蜂科（Trichogrammatidae）製作 7,000 餘玻片標本進行鏡檢分屬，共有 22 屬，其中包括臺灣已記錄者4屬 *Paracentrobia* Hwd., *Trichogrammatoidea* Grlt., *Trichogramma* West. 及 *Oligosita* Grlt.；臺灣新記錄 16 屬 *Ufens* Grlt., *Mirufens* Grlt., *Poropoea* Frst., *Ophioneurus* Rtbg., *Lathromeroidea* Grlt., *Lathromeris* Frst., *Hispidophila* Vigg., *Haeckeliania* Grlt., *Chaetostrichia* Wlk., *Uscana* Grlt., *Lathromeromyia* Grlt., *Giraultiola* Nwk., *Probrachista* Vigg., *Aphelinoidea* Grlt., *Epoligosita* Grlt. 及 *Megaphragma* Tblk.；及 2 新屬、新種（*Prochaetostricha monticola* 及 *Eutrichogramma elongatum*）之記載並附形態特徵圖，臺灣毛小蜂分屬檢索表及各屬特徵記載等以供查考。

1. 臺灣省農業試驗所 研究報告 第 1022 號。

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